

REMARKS

This application has been carefully reviewed in light of the Office Action dated August 25, 2004. Claims 26 and 71 have been amended. Claims 34-35 and 72 has been canceled. Claim 77 has been added. Claims 26-32, and 71, and 77 are now pending. Applicant reserves the right to pursue the original claims and other claims in this and other applications. Please reconsider the above-referenced application in light of the foregoing amendments and following remarks.

Applicant's undersigned representative acknowledges with appreciation the telephonic conference conducted with the Examiner on August 18, 2004. The Examiner and Applicant's undersigned representative discussed the Hamrah reference and the pending claims.

The Examiner acknowledged that Hamrah disclosed an etchant mixture consisting of  $\text{CHF}_3$ ,  $\text{CF}_4$ ,  $\text{NH}_3$ , and Argon (Example 3, page 6, lines 4-43). Applicant's undersigned representative pointed out that Applicant's claimed composition, in contrast, consists of at least one fluorocarbon and ammonia. The use of this etchant composition allows a conductive plug to adhere more effectively inside the etched contact opening (Applicant's specification, page 12, lines 8-10), and prevents erosion of sidewall spacers which materially detracts from the performance of a conductive plug and gate stack (Applicant's specification, page 12, lines 8-10).

The Examiner further acknowledged that Hamrah's disclosed composition was used to control the polysilicon etch rate. The Examiner conceded that there was no teaching or suggestion that Hamrah's composition prevented sidewall erosion and increased adhesion. As a result, the Examiner suggested that the claims be amended in a manner that would exclude Argon gas. The present amendment incorporates the Examiner's suggestions.

Moreover, the Examiner stated that claim language directed to the flow rate ratio would not be given patentable weight since it fails to show a structural difference between the claimed invention and the prior art. Claim language and the claims directed to the flow rate ratio has been removed. A detailed response to the August 25, 2004 Office Action is provided below.

Claims 26 and 71 stand rejected under 35 U.S.C. § 112, second paragraph as lacking proper antecedent basis. Claims 26 and 71 have been amended to obviate the rejection. The claim language, "the flow ratio," has been removed. Withdrawal of the § 112, second paragraph rejection is respectfully solicited.

Claims 26-30 and 32 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Hamrah. The rejection is respectfully traversed. Hamrah fails to anticipate the present invention. Hamrah does not disclose "a flowing plasma etchant mixture consisting of at least one fluorocarbon and ammonia," as recited in claim 26.

Hamrah teaches an etchant mixture for increasing the oxide etch rate while suppressing the polysilicon etch rate (Page 2, lines 33-34). Hamrah's etchant mixture consists of CHF<sub>3</sub>, Ar, CF<sub>4</sub>, and NH<sub>3</sub> (Example 2, lines 1-10, Example 3, lines 40-50, and page 7 (lines 15-55). It is clear that Hamrah's etchant mixture consists of four different gases: CHF<sub>3</sub>, Ar, CF<sub>4</sub>, and NH<sub>3</sub>. Hamrah's etchant mixture does not consist of at least one fluorocarbon and ammonia. Hamrah's etchant mixture includes Argon gas and does not anticipate Applicant's claimed composition.

Claims 27-30 and 32 depend from claim 26 and are similarly allowable for at least the reasons provided above. Withdrawal of the § 102(b) rejection is respectfully solicited.

Claim 31 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hamrah in view of Becker. The rejection is respectfully traversed.

For similar reasons provided above, Hamrah does not teach or suggest the limitations of claim 26 from which claim 31 depends. In particular, Hamrah does not teach or suggest "a flowing plasma etchant mixture consisting of at least one fluorocarbon and ammonia," as recited in claim 26. Hamrah discloses an etchant mixture consisting of four gases including Argon. Becker is relied upon for teaching an etchant composition consisting of  $\text{CF}_4$ ,  $\text{CHF}_3$  and  $\text{CH}_2\text{F}_2$ , and adds nothing to rectify the deficiencies associated with Hamrah.

Moreover, no motivation to combine the references exist. Becker teaches a chemical etchant composition of  $\text{CHF}_3$ ,  $\text{CF}_4$ , Ar, and a  $\text{CH}_2\text{F}_2$  additive material. The additive material is needed because " $\text{CH}_2\text{F}_2$  is added to offset the disassociation properties of nitride as compared to oxide." (Col. 2, lines 24-25). Becker's etchant composition relies on the presence of a silicon nitride layer, i.e., an etch-stop layer. (Col. 6, lines 16-20). In Hamrah, there is no silicon nitride layer. Hamrah's etchant mixture is used to control the polysilicon etch rate. The two references are directed at solving different problems. Withdrawal of the § 103(a) rejection is respectfully solicited.

Claim 71 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hamrah. The rejection is respectfully traversed.

Hamrah does not teach or suggest "a plasma etchant mixture consisting of at least two fluorocarbons  $\text{CF}_4$  and  $\text{NH}_3$ ," as recited in claim 71. As mentioned previously, Hamrah discloses an etchant mixture consisting of four gases including Argon. Withdrawal of the § 103(a) rejection is respectfully solicited.

Similarly, the prior art of record does not teach or suggest "a gaseous etchant mixture consisting of at least one fluorocarbon and ammonia," as recited in claim 77. Hamrah discloses an etchant composition which includes Argon.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

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Respectfully submitted,

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